

THE GENERA *IDEOBISIUM* AND *IDEOBLOTHRUS*, WITH REMARKS ON THE FAMILY SYARINIDAE (PSEUDOSCORPIONIDA)

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ABSTRACT

Ideobisium Balzan and *Ideoblothrus* Balzan are redefined after examination and redescription of the types, *Ideobisium crassimanum* Balzan and *Ideoblothrus similis* Balzan. *Pachychitra* Chamberlin is shown to be a synonym of *Ideoblothrus*. All known species of each genus are listed and doubtful species are discussed; *Ideobisium balzanii* With and *Ideoblothrus seychellesensis* (Chamberlin) are redescribed; and the following new species are described: *Ideobisium chapmani*, *I. peckorum*, *I. ecuadorensis*, *I. puertoricense*, *I. yunqueense*, and *Ideoblothrus kochalkai*, *I. colombiae*. The assignment of these genera to the family Syarinidae is discussed.

INTRODUCTION

The genus *Ideobisium* was created by Balzan (1891) with *I. crassimanum*, sp. nov., as its type species. At the same time, another species, *I. similis*, sp. nov., was also placed in the genus, but in a new subgenus named *Ideoblothrus*, primarily on the basis of its lack of eyes. [Also at that time, Balzan considered *Ideoroncus* Balzan 1890 as a subgenus of *Ideobisium*, but *Ideoroncus* has subsequently been recognized as a distinct and very different genus (Chamberlin 1930)]. Balzan placed *Ideobisium* in his new family Pseudobisiidae, which was differentiated from Obisiidae Hagen by the possession of a distinct process (galea) on the movable finger of the chelicera. Chamberlin (1930) rejected the name Pseudobisiidae because there is no genus *Pseudobisium* and substituted the name Ideobisiinae, with *Ideobisium* as type genus; he considered the group a subfamily of his newly erected family Neobisiidae, with the presence of a distinct galeal process as the distinguishing character. Beginning with Chamberlin (1930) the name *Ideoblothrus* has been ignored and species have been assigned to *Ideobisium* (without subgeneric distinction) with no regard for the presence or absence of eyes.

Several years ago, while studying examples of *Ideobisium* Balzan and *Pachychitra* Chamberlin from the Caribbean area, I noted the many similarities of the two genera. But it was only after the discovery of the lanceolate form of trichobothrium *t* (Muchmore 1979) that I was able to recognize the true nature of their relationship. Mahnert

(1979:750) also noted the resemblance of *Ideobisium* and *Pachychitra*, but was unable to carry his analysis to a satisfactory conclusion.

As will be shown below, *Pachychitra* Chamberlin is actually a synonym of *Ideoblothrus* Balzan, which is indeed closely related to *Ideobisium* Balzan, and both are referable to the family Syarinidae.

I have been able to study the types of *I. crassimanum* Balzan and *I. similis* Balzan through the kind cooperation of Dr. J. Heurtault, Muséum National d'Histoire Naturelle, Paris. Also, I have seen a large amount of material pertaining to *Ideobisium* and *Ideoblothrus* from North, Middle and South America, the Caribbean area, and scattered other parts of the world. Depositories referred to in the text are abbreviated thus:

[ACC]	Academia de Ciencias de Cuba, La Habana.
[AMNH]	American Museum of Natural History, New York, N. Y.
[BM(NH)]	British Museum (Natural History), London.
[FSCA]	Florida State Collection of Arthropods, Gainesville, Florida. (My own specimens are deposited here.)
[JCC]	J. C. Chamberlin Collection, Forest Grove, Oregon.
[MCZ]	Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts.
[MNHN]	Muséum National d'Histoire Naturelle, Paris.

SYSTEMATICS

Ideobisium Balzan

Ideobisium Balzan 1891:543, Fig. 33, 33a; Chamberlin 1930:23, 36; Beier 1932:157; Mahnert 1979:750. Type species *Ideobisium crassimanum* Balzan 1891, by original designation.

Diagnosis (revised).—A genus of the superfamily Neobisioidea Chamberlin (1930:7). Species generally small and robust. Carapace about square; anterior margin with a broad, low, rounded epistome; surface smooth; four distinct eyes; 22-28 vestitural setae, with four at anterior and six to eight at posterior margins. Apex of palpal coxa acute, with two long setae. Tergites and sternites entire, except sternites 2-5 often weakly divided; surfaces smooth; tergites 1-3 usually with six and tergite 4 with seven or eight setae; pleural membranes granulate anteriorly, becoming longitudinally granulo-striate or smoothly striate posteriorly. Internal genital setae of male arranged as two parallel, longitudinal rows of three. Cheliceral fingers toothed; hand with five acuminate setae, *es* shortest; flagellum of six or seven setae, all finely serrate except the basal one, which is also shorter than the others; galea long, simple. Palp robust, none of the segments more than 3.0 times as long as broad; all surfaces smooth; movable chelal finger shorter than the chelal hand; venom apparatus developed only in fixed finger, with duct short, extending less than half the distance to trichobothrium *et*; chelal teeth contiguous, at least the distal ones cusped. Trichobothrium *t* on movable chelal finger shorter than all others and lanceolate at tip; *t*, *st* and *sb* usually closely grouped in an obliquely oriented series, with *t* proximad of middle of finger; on fixed finger *it* nearer level of *et* than of *est*; *isb* on external side of hand near base of fixed finger; *eb* and *esb* on side of hand, usually near the middle (Fig. 1). Leg I with basifemur 1.25 or more times as long as telofemur. Leg IV with femur distinctly indented dorsally at suture between its parts, the suture

itself slightly oblique to long axis of femur; tibia and each tarsal segment with a prominent tactile seta proximad of middle. Subterminal tarsal setae finely denticulate in distal half; arolia shorter than claws.

Distribution.—Best known from northern South America and the West Indian islands, it is also represented in New Zealand and New Caledonia.

Remarks.—Because of its overall similarity to *Ideoblothrus*, especially in the possession of only two setae on the apex of the palpal coxa and of a lanceolate trichobothrium *t*, and in spite of the granulate pleural membranes, *Ideobisium* must now be considered a member of the family Syarinidae, *not* of the Neobisiidae.

With the removal of *Ideobisium* from the family Neobisiidae, the name Ideobisiinae is no longer valid for the group of neobisiids with distinct galeal processes. In view of the many uncertainties about relationships among the Neobisiidae, it seems best to refrain from naming subfamilies until more comparative work is done.

Ideobisium crassimanum Balzan

Figs. 2-9

Ideobisium crassimanum Balzan 1891:541; Chamberlin 1930:36-37; Beier 1932:158; *nec* Beier 1976:46.

Material examined.—Holotype female from Caracas, Venezuela (Col. Mus. 14.155) [MNHM]. The specimen is mounted on two microscope slides, numbered 442 and 443; the left chelicera and the left palpal tibia and chela are missing, and the right palpal femur and chela are partially crushed. Also at hand are two males and three females from Rancho Grande, Aragua, Venezuela, 19-27 February 1971, S. Peck [FSCA].

Description.—Based on the holotype and the other five adults, considered conspecific in spite of some differences. Males and females similar in form, but females a little larger. Carapace and palps well sclerotized and reddish brown, other parts lighter brown. Carapace smooth; epistome broad, low, rounded (Fig. 2); four large corneate eyes; chaetotaxy of holotype 4-4-4-2-7 = 21, of others usually 4-4-4-6-6 = 24. Coxal area generally typical of the Neobisiodea; apex of palpal coxa acute, bearing two long setae.

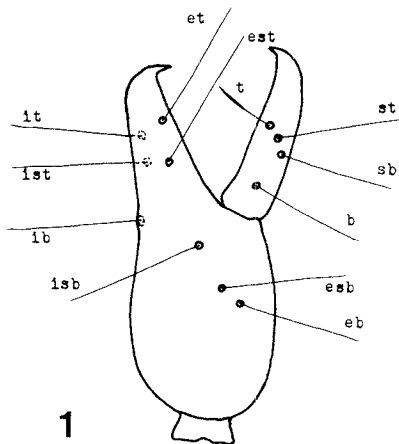


Fig. 1.—*Ideobisium* sp.: lateral view of palpal chela, showing locations of trichobothria.

Abdomen elongate; tergites and posterior sternites entire. Anterior sternites with a tendency toward division, as evidenced by faint longitudinal wrinkles at the midline; surfaces smooth; pleural membranes heavily granulated anteriorly, becoming longitudinally striate posteriorly. Tergal chaetotaxy of holotype female 6:6:8:8:8:9:10:9:9:8:T1T1T1T:2; sternal chaetotaxy of same 8:(3)10(3):(3)6(3):12:13:11:11:10:9:T1T:2; anterior sternites of males with about 8:[3-3]:(3)5/7(3):(3)6(3)-; genital areas of female and male shown in Figs. 3 and 4.

Chelicera about 0.6 as long as carapace; hand with five acuminate setae; flagellum of six or seven setae, equal in length except the proximal one shorter, all finely denticulate except the proximal one; fixed finger with about 12 small, and movable finger with about 10 larger, teeth; galea of both sexes long, slender, gently curved (Fig. 5).

Palp stout (Fig. 6); femur 2.35-2.55, tibia 1.85-1.9, and chela (without pedicel) 2.05-2.1 times as long as broad; hand (without pedicel) 1.15-1.25 times as long as deep; movable finger 0.83-0.89 as long as hand. All surfaces smooth. Fixed chelal finger with 29-32 and movable finger with 37-42 cusped, marginal teeth. Trichobothria of chela as shown in Fig. 7; on movable finger, *t* is shorter than the others and lanceolate near the tip, as illustrated (Fig. 8); *isb* is on the side of the hand near base of fixed finger, while *eb* and *esb* are situated more proximally and ventrally.

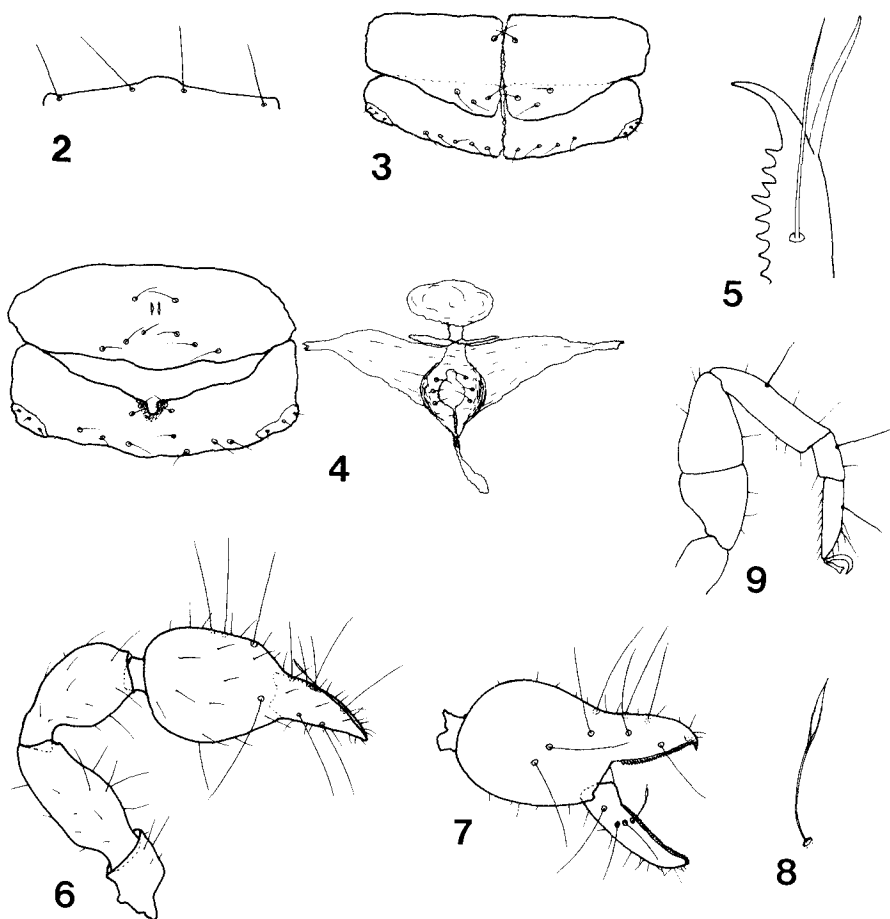
Legs rather short and stout. Leg I with basifemur about 1.3 times as long as telofemur; leg IV (Fig. 9) with entire femur 2.4-2.65 and tibia 3.9-4.15 times as long as deep. Dorsal contour of femur of leg IV broken by a distinct indentation at junction of basifemur and telofemur; the line of articulation between the two segments slightly oblique to the long axis of the femur as a whole. Subterminal tarsal setae finely pinnate along ventral sides; arolia shorter than claws. Tibia, metatarsus and telotarsus of leg IV each with a long tactile seta proximal to the middle.

Measurements (mm).—Holotype female. Body length 1.75. Carapace length 0.64. Chelicera 0.39 by 0.185. Palpal femur 0.55 by 0.215; tibia 0.50 by ?; chela (without pedicel) 0.93 by ?; hand (without pedicel) 0.54 by ?; pedicel 0.075 long; movable finger 0.45 long. Leg I: basifemur 0.27 long; telofemur 0.20 long. Leg IV: entire femur 0.57 by 0.235; tibia 0.435 by 0.11; metatarsus 0.16 by 0.08; telotarsus 0.26 by 0.07.

Ranges of five adults from Rancho Grande.—Body length 1.68-2.03. Carapace length 0.57-0.64. Chelicera 0.31-0.385 by 0.155-0.185. Palpal femur 0.445-0.52 by 0.19-0.22; tibia 0.41-0.49 by 0.215-0.25; chela (without pedicel) 0.695-0.88 by 0.33-0.415; hand (without pedicel) 0.41-0.495 by 0.33-0.42; pedicel 0.06-0.07 long; movable finger 0.355-0.43 long. Leg I: basifemur 0.22-0.26 long; telofemur 0.185-0.20 long. Leg IV: entire femur 0.48-0.555 by 0.19-0.22; tibia 0.37-0.435 by 0.095-0.105; metatarsus 0.14-0.16 by 0.075-0.08; telotarsus 0.215-0.27 by 0.06-0.065.

Remarks.—Based on the measurements given by Balzan (1891:543) this species has always been characterized as having *very* short fingers on the palpal chela (Beier 1932:157). However, examination of the type specimen has shown that the fingers, while short compared with many pseudoscorpions, are about the same relative length as those in other *Ideobisium* species. Evidently some error was made in Balzan's original report.

As mentioned above, there is a difference in the chaetotaxies of the carapace between the holotype from Caracas and the specimens from Rancho Grande; in the row just anterior to the posterior marginal row, the holotype has two setae, while the others have six. Whether this difference is significant is not clear, because other characters are very similar. The problem can be resolved only by study of further material from the vicinity of Caracas.



Figs. 2-9.—*Ideobisium crassimanum* Balzan: 2, anterior margin of carapace; 3, genital opercula of female; 4, genital opercula (left) and internal genitalia (right) of male; 5, tip of movable finger of chelicera; 6, dorsal view of left palp; 7, lateral view of right chela; 8, trichobothrium *t*; 9, leg IV.

Three specimens from Trinidad may belong here, though they have some characters intermediate between this species and *I. balzanii* With (see below). Proper understanding of their position can come only after study of more material from eastern Venezuela and the Lesser Antilles.

The specimens reported by Beier (1976) from the Dominican Republic certainly do not pertain to *I. crassimanum*, but rather to one of the species described below from Puerto Rico or to an undescribed indigenous species.

Ideobisium balzanii With
Fig. 10

Ideobisium Balzanii With, 1905:131.

I. balzanii: Chamberlin 1930:37, 1931, Fig. 35,0; Hoff 1945:1.

I. balzani: Beier 1932:158.

Material examined.—Paratype male (JC12.01001) from St. Vincent, West Indies [JCC]; three males and three females from “tamisage de hojarosca” at “Morn à Louis” (= Morn à l'Eau?), Guadeloupe, French West Indies, 15 March 1975 (F. Chalumeau), [ACC]; one male from Laudat, Dominica, West Indies, 12 June 1911, [AMNH]; one male from Long Ditton, Dominica, 21 June 1911, [AMNH].

Diagnosis.—Generally similar to *I. crassimanum*, but with less robust palps, l/w ratio of femur being 2.6-2.8 and that of chela 2.35-2.5.

Description.—The description given by With (1905:131-135 and Figs. 2a-h) for specimens from St. Vincent is generally accurate and fairly complete. Here are provided some supplemental data and measurements for the specimens listed above.

The sexes generally similar but female a little larger than male. Chaetotaxy of carapace usually 4-4-4-4-6 = 22. Palpal coxa with two long setae at apex. Abdominal tergites and posterior sternites entire, anterior sternites often divided by faint sutures along the midline; pleural membranes heavily granulate anteriorly, becoming sparsely granulate posteriorly. Tergal chaetotaxy about 6:6:6:8:8:8:8:9:9:7:T1T1T1T:2; sternal chaetotaxy of male about 8:[3-3]:(3)14(3):(3)6(3):10:12:10:10:10:8:T1T:2. Genital opercula of female with 8-10 setae on face of each. Chelicera about 0.6 as long as carapace; hand with five acuminate setae; flagellum of six or seven setae, the proximal one shorter than the others. Palpal segments entirely smooth, including inner surface of chelal hand, except for rather prominent bases of some setae. Trichobothria on chela as shown in Fig. 10; *t* short and lanceolate as in *I. crassimanum*. Palpal femur 2.6-2.8, tibia 1.85-2.05, chela (without pedicel) 2.35-2.5 times as long as broad; hand (without pedicel) 1.25-1.5 times as long as deep; movable finger 0.83-0.95 as long as hand. Fixed finger with 35-40 and movable finger with 43-49 cusped, marginal teeth. Legs rather stout; leg I with basifemur 1.25-1.3 times as long as telofemur; leg IV with entire femur 2.35-2.55 times as long as deep. Dorsal surface of leg IV depressed at junction between basifemur and telofemur. Subterminal tarsal setae dentate. Tibia, metatarsus and telotarsus each with a prominent tactile seta proximad of middle.

Measurements (mm).—Figures given first for the paratype, followed in parentheses by ranges for the other specimens from Guadeloupe and Dominica. Body length 1.58(1.47-2.18). Carapace length 0.55(0.555-0.65). Chelicera 0.32(0.33-0.41) long. Palpal femur 0.45(0.465-0.60) by 0.17(0.185-0.22); tibia 0.415(0.45-0.555) by 0.21(0.235-0.27); chela (without pedicel) 0.72(0.79-0.985) by 0.295(0.33-0.42); hand (without pedicel) 0.38(0.435-0.585) by 0.27(0.325-0.415); pedicel about 0.07 long; movable finger 0.355(0.39-0.495) long. Leg I: basifemur 0.245(0.235-0.28) long; telofemur 0.18(0.19-0.215) long. Leg IV: entire femur 0.53(0.51-0.59) by 0.23(0.215-0.25); tibia 0.385(0.385-0.445) by 0.095-0.11).

Remarks.—Though the paratype from St. Vincent is a little smaller than the specimens from Dominica and Guadeloupe, there is a good agreement in other characters and they are all considered conspecific.

Ideobisium chapmani, new species

Fig. 11

Material.—Holotype male (WM 3449.01001) from “guano patches below bat roosts, terminal upstream chamber” of Camburales Cave, 10 km E Curimagua, Serrania de San Luis, Falcon, Venezuela, 20 May 1973; paratype female in “leaf litter on summit of the ridge separating Acarite and Camburales valleys,” 7 km E Curimagua, Serrania de San

Luis, Falcon, Venezuela, 20 March 1973; both collections by Philip Chapman [FSCA].

Diagnosis.—Generally similar to *I. crassimanum*, but appendages a little slimmer (chela of male 2.45 times as long as broad) and trichobothrium *eb* situated far proximad and ventrad on side of chelal hand.

Description.—Male and female generally similar but female larger and darker. Carapace smooth; epistome broad, low rounded; four eyes present, smaller and less convex than in *I. crassimanum*; chaetotaxy of holotype 4-6-4-6-7 = 27, of paratype 4-6-4-6-8 = 28. Coxal area typical.

Abdominal tergites and posterior sternites entire, anterior sternites weakly divided; pleural membranes heavily granulate anteriorly, becoming longitudinally granulo-striate posteriorly. Tergal chaetotaxy of holotype 6:6:7:8:9:10:9:10:8:7:T1T1T1T:2; sternal chaetotaxy of male 9:[3-3]:(3)4/8(2):(3)8(3):10:11:11:11:10:10:T1T:2.

Chelicera 0.6 as long as carapace; hand with five setae; flagellum of six or seven setae, the proximal one shorter and simple; fixed finger with about 15 small, and movable finger with about 10 larger, teeth; galea in both sexes long, slender, curved.

Palp stout; femur 2.4-2.6, tibia 1.9-2.0, and chela 2.25-2.45 times as long as broad; hand 1.25-1.35 times as long as deep; movable finger 0.85-0.88 as long as hand. All surfaces smooth. Fixed chelal finger with 29-37 and movable finger with 37-45 cusped, marginal teeth. Trichobothria on chela as shown in Fig. 11; *t* shorter than the others and lanceolate at the tip; *sb* somewhat removed from *t* and *st*, nevertheless nearer to *st* than to *b*; the three trichobothria on side of hand widely spaced, with *isb* at base of fixed finger and *eb* far proximad and ventral.

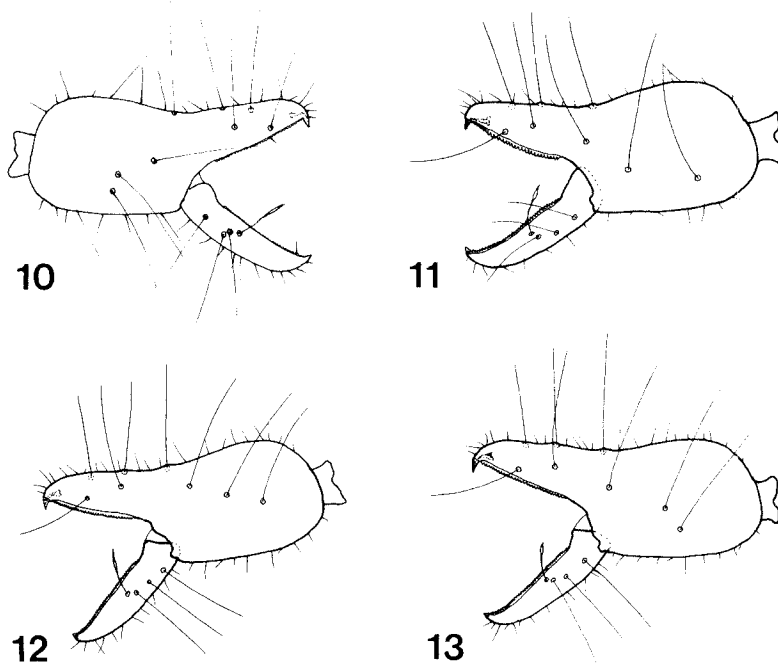


Fig. 10.—*Ideobisium balzanii* With: lateral view of right chela. Fig. 11.—*Ideobisium chapmani*, new species holotype male: lateral view of left chela. Fig. 12.—*Ideobisium peckorum* new species, holotype male: lateral view of left chela. Fig. 13.—*Ideobisium ecuadorensis*, new species, holotype male: lateral view of left chela.

Legs rather short and stout. Leg I with basifemur 1.3-1.35 times as long as telofemur. Leg IV with entire femur 2.6-2.7 and tibia 4.2-4.4 times as long as deep. Tibia, metatarsus and telotarsus of leg IV each with a prominent tactile seta proximad of the middle.

Measurements (mm).—Figures given first for the holotype male, followed in parentheses by those for the female. Body length 1.7(2.0). Carapace length 0.605(0.725). Chelicera 0.36(0.43) long. Palpal trachanter 0.295(0.37) by 0.18(0.215); femur 0.52(0.635) by 0.215(0.245); tibia 0.495(0.59) by 0.26 (0.295); chela (without pedicel) 0.87(1.06) by 0.355(0.47); hand (without pedicel) 0.49(0.605) by 0.36(0.48); pedicel 0.08(0.09) long; movable finger 0.415(0.53) long. Leg I: basifemur 0.28(0.32) long; telofemur 0.21(0.245) long. Leg IV: entire femur 0.55(0.635) by 0.215(0.235); tibia 0.435(0.525) by 0.105(0.12).

Etymology.—The species is named for Philip Chapman, who collected the specimens.

Remarks.—The weakly developed eyes of this species might be taken as evidence that it is partially adapted for life in the dark cave. However, other parts of the animals are normal. Further, there are at hand several specimens taken from leaf litter in Valle, Colombia, which have similarly reduced eyes and a similar trichobothrial pattern. These may be conspecific with *I. chapmani*, but because they are significantly smaller they have not been considered paratypes.

The possibility must be recognized that this species is actually *I. (Ideoroncus) gracilis* Balzan, which was characterized as having only two eyes (see discussion below).

Ideobisium peckorum, new species

Fig. 12

Material.—Holotype male (WM2893.02001) and five paratypes (2♂, 3♀) separated from forest litter 7 km N Leticia, Amazonas, Colombia, 20-25 February 1972 (Stewart and Jarmila Peck), [FSCA].

Diagnosis.—Much like *I. chapmani* but smaller, with well-developed eyes, with slightly more slender appendages (chela of male 2.75 times as long as broad), and with trichobothrium *isb* distinctly proximad of *ib*.

Description.—Sexes similar though females larger than males. Carapace smooth; epistome very low, broad; four large corneate eyes; chaetotaxy 4-6-4-6-6- = 26. Coxal area typical.

Abdominal tergites and posterior sternites entire, anterior sternites weakly divided; pleural membranes strongly granulate anteriorly, becoming longitudinally lined posteriorly. Tergal chaetotaxy of holotype male 6:6:6:7:7:8:8:8:7:7:T1T1T1T:2; sternal chaetotaxy of same 8:[3-3):(3)4/8(3):(3)9(3):12:11:10:10:8:8:T1T:2. Anterior genital operculum of female usually with a group of eight setae and posterior operculum with a row of eight setae; one female apparently abnormal in having three small groups of about 10 tiny setae on the anterior operculum and a double row of 11 setae on the posterior operculum.

Chelicera nearly 0.6 as long as carapace; hand with five setae; flagellum of seven setae, the proximal one shorter and simple; fixed finger with about 15 small, and movable finger with about 8 larger, teeth; galea in both sexes long, slender, gently curved.

Palp stout; femur 2.55-3.0, tibia 1.95-2.05, and chela 2.4-2.75 times as long as broad; hand 1.4-1.55 times as long as deep; movable finger 0.81-0.87 as long as hand. All surfaces smooth. Fixed chelal finger with 32-37 and movable finger with 43-47 cusped, marginal teeth. Trichobothria on chela as shown in Fig. 12; *t* is shorter than the others

and lanceolate at the tip; *sb* somewhat removed from *t* and *st*, nevertheless nearer to *st* than to *b*; the three trichobothria on the side of the hand rather widely spaced, with *isb* distinctly proximad of *ib* and *eb* below and behind the middle of the hand.

Legs rather short and stout. Leg I with basifemur 1.25-1.3 times as long as telofemur. Leg IV with entire femur 2.25-2.75 and tibia 3.9-4.05 times as long as deep. Tibia, metatarsus and telotarsus of leg IV each with a prominent tactile seta proximal to the middle.

Measurements (mm).—Figures given first for the holotype male, followed in parentheses by ranges for the five paratypes. Body length 1.72(1.74-2.21). Carapace length 0.605(0.59-0.66). Palpal trochanter 0.28(0.27-0.315) by 0.17(0.165-0.185); femur 0.51(0.48-0.525) by 0.17(0.165-0.205); tibia 0.445(0.43-0.48) by 0.22(0.21-0.245); chela (without pedicel) 0.815(0.80-0.92) by 0.325(0.295-0.38); hand (without pedicel) 0.48(0.45-0.54) by 0.32(0.29-0.385); pedicel about 0.065 long; movable finger 0.39(0.385-0.445) long. Leg I: basifemur 0.245(0.235-0.27) long; telofemur 0.20(0.19-0.205) long. Leg IV: entire femur 0.529(0.495-0.54) by 0.195(0.18-0.215); tibia 0.385(0.37-0.42) by 0.095-0.105).

Etymology.—The species is named for Stewart and Jarmila Peck who collected these as well as many other tropical pseudoscorpions.

Ideobisium ecuadorensis, new species

Fig. 13

Material.—Holotype male (WM 4700.01001) and paratype female from forest litter near Los Tayos Caves, Cordillera el Condor, Ecuador (3°01'S, 78°15'W), 17 July and 1 August 1976 (N. P. Ashmole), [FSCA].

Diagnosis.—Slightly larger than *I. crassimanum*, with 26 setae on carapace, and with trichobothria *eb* and *esb* near middle of lateral side of chelal hand, both far removed from *isb*.

Description.—Female like male but a little larger. Carapace and palps light reddish brown, other parts lighter. Carapace smooth; epistome very low, rounded; four large, corneate eyes; chaetotaxy 4-6-4-6-6 = 26. Coxal area typical; palpal coxa with two long setae on apex.

Abdomen elongate; tergites and sternites entire; surfaces smooth; pleural membranes heavily granulate anteriorly, becoming longitudinally striate on posterior segments. Tergal chaetotaxy of male 6:6:6:8:8:8:8:8:7:T1T1T1T:2; sternal chaetotaxy 8:[3-3]:(3)4/10(3):(2)10(3):10:11:10:10:9:9:T1T:2. Middle and posterior tergites and sternites of female with one or two more setae than in male; anterior operculum with eight setae, arranged as in *I. crassimanum*.

Chelicera about 0.6 as long as carapace; hand with five setae; flagellum of six or seven setae, the proximal one shorter and simple; fixed finger with 14 or 15 small, and movable finger with 11 or 12 larger, teeth; galea simple, longer and more curved in female than in male.

Palp stout; femur 2.65-2.9, tibia 1.95-2.05, and chela 2.25-2.5 times as long as deep; hand 1.35-1.4 times as long as deep; movable finger 0.85-0.86 as long as hand. All surfaces smooth. Fixed chelal finger with 30-32 and movable finger with 42-43 cusped marginal teeth. Trichobothria on chela as shown in Fig. 13; *t* is shorter than the others and lanceolate at the tip; *st* a little nearer to *t* than to *sb*; *isb* at the same level as *ib* and well separated from *eb* and *esb* which lie near middle of side of hand.

Legs rather short and stout. Leg I with basifemur 1.3 times as long as telofemur. Leg IV with entire femur 2.5-2.7 and tibia 4.0-4.2 times as long as deep. Tibia, metatarsus and telotarsus each with a prominent tactile seta proximad to the middle.

Measurements (mm).—Figures given first for the holotype male, followed in parentheses by those for the female. Body length 1.84(2.0). Carapace length 0.615(0.62). Palpal trochanter 0.295(0.31) by 0.19(0.20); femur 0.555(0.57) by 0.19(0.215); tibia 0.48(0.51) by 0.245(0.25); chela (without pedicel) 0.85(0.92) by 0.34(0.41); hand (without pedicel) 0.48(0.54) by 0.34(0.40); pedicel about 0.07 long; movable finger 0.415(0.46) long. Leg I: basifemur 0.265(0.29) long; telofemur 0.21(0.22) long. Leg IV: entire femur 0.54(0.58) by 0.20(0.23); tibia 0.42(0.465) by 0.105(0.11).

Etymology.—The species is named for Ecuador, the country in which it has been found.

Ideobisium puertoricense, new species

Figs. 14, 15

Material.—Holotype male (WM 2509.02003) and 20 paratypes (13♂, 7♀) from rain-forest litter in the Luquillo Mountains (elev. 424m) in NE Puerto Rico, 28 March 1967, E. W. McMahon, [FSCA]; one male and two female paratypes from basal "leaf sheaths" of dead cycads on El Yunque beside route 915 in NE Puerto Rico, 18 September 1977, A. R. Gillogly and H. J. Harlan, [FSCA]; many paratypes (3♂, 3♀ mounted) from litter in Aguas Buenas Forest near Aguas Buenas Cave (elev. 25m) in east central Puerto Rico, 7-17 May 1973, S. B. Peck, [FSCA]. Five specimens (4♂, 1♀) from leaf litter, near Maricao, in western Puerto Rico, 5 January 1977, J. A. Mari Mutt, [FSCA]; considered conspecific in spite of some small differences.

Diagnosis.—Similar to *I. crassimanum* but with palpal chela less stout, 1/w of chela 2.2 or greater and movable finger 0.85 or more as long as hand; carapace usually with 26 setae, rather than 24.

Description.—Males and females similar, but females larger. Palps and carapace well sclerotized and reddish brown, other parts lighter. Carapace smooth; epistome broad, low, rounded; four eyes; chaetotaxy of holotype 4-6-4-6-6 = 26, others similar but often with 4, 5, or 7 instead of 6 in the fourth row. Coxal area typical.

Abdominal tergites and posterior sternites entire, anterior sternites weakly divided; pleural membranes heavily granulate anteriorly, becoming longitudinally granulo-striate posteriorly. Tergal chaetotaxy of holotype male 6:6:6:9:9:8:9:9:7:7:T1T1T1T:2, sternal chaetotaxy of same 9:[3-3]:(3)4/8(3):(3)8(3):11:10:10:10:8:9:T1T:2; others similar but variable; anterior genital operculum of female with seven to nine setae.

Chelicera about 0.6 as long as carapace; hand with five setae, *es* short; flagellum of six or seven dentate setae, the proximal one shorter than the others; each finger with six to eight teeth; galea slender, curved, longer in female than in male; serrula exterior of about 30 blades.

Palp stout (Fig. 14); femur 2.5-3.0, tibia 1.85-2.15, and chela 2.2-2.7 times as long as broad; hand 1.25-1.5 times as long as deep; movable finger 0.85-0.95 as long as hand. All surfaces smooth. Fixed chelal finger with 29-41 and movable finger with 43-58 cusped, marginal teeth. Trichobothria on chela as shown in Fig. 15; *t* shorter than the others and broadly lanceolate on outer third; *esb* nearer to *eb* than to *isb* on side of hand.

Legs rather short and stout. Leg I with basifemur 1.2-1.3 times as long as telofemur. Leg IV with entire femur 2.4-2.8 and tibia 3.65-4.25 times as long as deep. Tibia, metatarsus and telotarsus each with a tactile seta proximad of the middle.

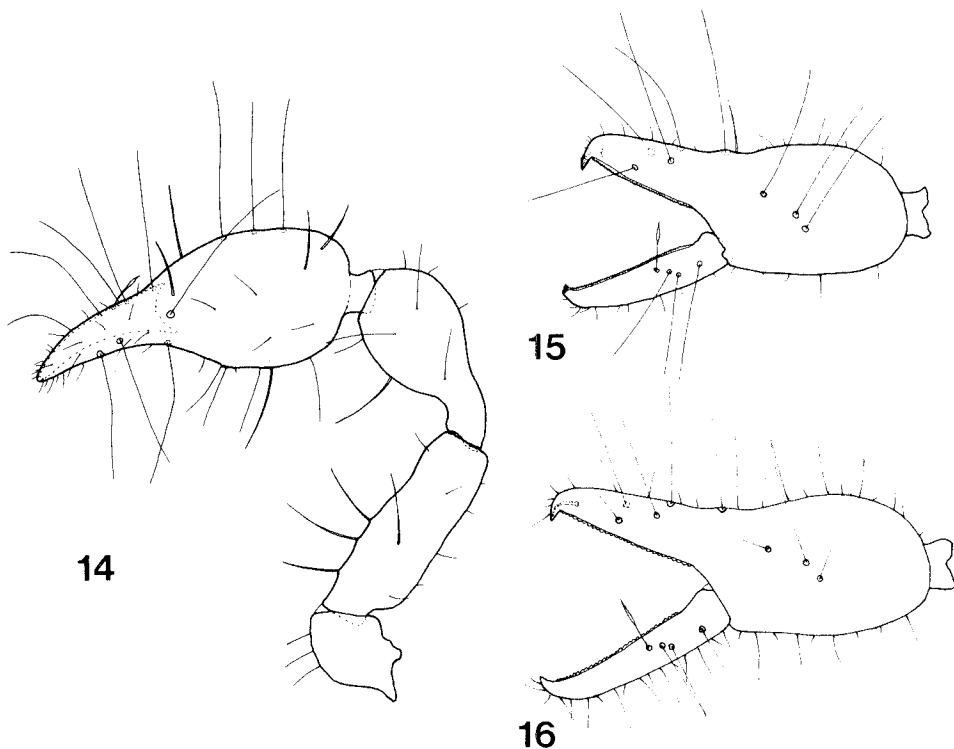
Measurements (mm).—Figures given first for the holotype, followed in parentheses by ranges for the mounted paratypes. Body length 1.8(1.7-2.4). Carapace length 0.63(0.57-0.68). Chelicera 0.35(0.31-0.43) long. Palpal femur 0.55(0.47-0.65) by 0.21(0.18-0.22); tibia 0.495(0.42-0.57) by 0.255(0.275-0.29); chela (without pedicel) 0.85(0.72-1.035) by 0.335(0.30-0.46); hand (without pedicel) 0.465(0.41-0.605) by 0.325(0.31-0.45); pedicel 0.05-0.075 long; movable finger 0.42(0.36-0.52) long. Leg I: basifemur 0.265(0.23-0.32) long; telofemur 0.215(0.18-0.25) long. Leg IV: entire femur 0.56(0.50-0.66) by 0.22(0.18-0.235); tibia 0.41(0.36-0.51) by 0.105(0.095-0.12).

Etymology.—The species is named for Puerto Rico, where it is found.

Remarks.—Three females from the Dominican Republic appear to belong to this species. They were collected by W. L. Brown at La Cienaga, La Vega, at an altitude of 1100m. The *I. crassimanum* recorded by Beier (1976) from 1250m in the Cordillera Central, Dominican Republic, may belong here.

Ideobisium puertoricense cavicolum, new subspecies

Material.—Holotype male (WM 3931.01006) and 12 paratypes from bat guano in Aguas Buenas Cave, Aguas Buenas, Puerto Rico, 3 May 1974, S. B. Peck [FSCA].



Figs. 14, 15.—*Ideobisium puertoricense*, new species, holotype male: 14, dorsal view of right palp; 15, lateral view of left chela. Fig. 16.—*Ideobisium yunqueense*, new species, holotype male: lateral view of left chela.

Diagnosis.—When compared to specimens of *I. p. puertoricense* found just outside Aguas Buenas Cave, this population differs in several important features which suggest incipient adaptation to the subterranean environment — the color, especially of carapace, tergites and legs, is lighter; the size is larger; and the palpal segments are less stout.

Description.—Palps reddish brown, but carapace, abdomen and legs much lighter. Carapace like the nominate subspecies, with four eyes; chaetotaxy 4-6-4-6-6 = 26. Palpal femur 2.85-3.15, tibia 2.0-2.15, and chela 2.25-2.65 times as long as broad; hand 1.3-1.5 times as long as deep; movable finger 0.81-0.90 as long as hand. Leg IV with entire femur 2.6-2.9 and tibia 4.25-4.8 times as long as deep.

Measurements (mm).—Figures given first for holotype, followed in parentheses by ranges for the 11 adult paratypes. Body length 2.1(2.0-2.75). Carapace length 0.665(0.64-0.755). Chelicera 0.385(0.36-0.44) long. Palpal femur 0.63(0.59-0.70) by 0.20(0.20-0.24); tibia 0.58(0.53-0.63) by 0.27(0.27-0.32); chela (without pedicel) 0.94(0.90-1.11) by 0.37(0.36-0.48); hand (without pedicel) 0.52(0.50-0.635); pedicel 0.07-0.08 long; movable finger 0.47(0.44-0.52) long. Leg I: basifemur 0.27(0.265-0.33) long; telofemur 0.22(0.22-0.265). Leg IV: entire femur 0.62(0.60-0.70) by 0.23(0.22-0.25); tibia 0.47(0.46-0.56) by 0.11(0.10-0.13).

Etymology.—The subspecies is named *cavicolum* for its cavernicolous habitat.

Ideobisium yunqueense, new species

Fig. 16

Material.—Holotype male (WM 2250.01001) and paratype female from Mt. Britton, El Yunque (elev. 730m) in NE Puerto Rico, 6 September 1964, [FSCA]. Paratype male and female from El Yunque, Puerto Rico, April 1969, (T. Hlavac), [FSCA]. Paratype male from El Yunque Biological Station (elev. 825m), Puerto Rico, 25 January 1964, [MCZ].

Diagnosis.—Similar to *I. puertoricense* but larger (palpal femur longer than 0.70 mm) and with slightly more slender appendages (palpal femur with 1/w 3.0 or greater).

Description.—Male and female similar but female larger. Palps, carapace and tergites dusky brown, other parts lighter. Carapace smooth; epistome low, broad, rounded; four eyes; chaetotaxy of holotype and one paratype 4-6-4-6-6 = 26, two paratypes with 4-6-4-5-6 = 25. Coxal area typical.

Abdominal tergites and posterior sternites entire, anterior sternites divided; pleural membranes heavily granulate anteriorly, becoming longitudinally granulo-striate posteriorly. Tergal chaetotaxy of holotype 6:6:6:8:9:9:9:9:7:7:T1T1T1T:2; sternal chaetotaxy of same 7:[3-3]:(3)4/11(3):(3)8(3):12:11:11:10:10:10:T1T:2; others similar but varied; anterior operculum of female with seven or eight setae.

Chelicera about 0.6 as long as carapace; hand with five setae, *b* and *es* shorter than others; each finger with 8-12 teeth; galea slender, curved, longer in female than in male; serrula exterior with about 32 blades.

Palp rather stout; femur 3.0-3.05, tibia 2.05-2.15, and chela 2.4-2.7 times as long as broad; hand 1.35-1.5 times as long as deep; movable finger 0.9-1.0 as long as hand. All surfaces smooth. Fixed chelal finger with 38-40 and movable finger with 50-54 cusped teeth. Trichobothria on chela as shown in Fig. 16; *t* broadly lanceolate in the outer 2/5; *esb* nearer to *eb* than to *isb* on side of hand.

Legs rather short and stout. Leg I with basifemur 1.25-1.35 times as long as telofemur. Leg IV with entire femur 2.65-2.85 and tibia 4.2-4.4 times as long as deep. Tactile seta proximad of middle on tibia and each tarsal segment.

Measurements (mm).—Figures given first for the holotype, followed in parentheses by ranges for the three paratypes. Body length 2.15(2.2-2.7). Carapace length 0.76(0.755-0.83). Chelicera 0.445(0.41-0.495) long. Palpal femur 0.70(0.70-0.755) by 0.23(0.23-0.25); tibia 0.635(0.63-0.665) by 0.30(0.295-0.325); chela (without pedicel) 1.065(1.095-1.21) by 0.42(0.41-0.52); hand (without pedicel) 0.59(0.585-0.71) by 0.40(0.39-0.53); pedicel about 0.07 long; movable finger 0.555(0.58-0.635) long. Leg I: basifemur 0.33 (0.34-0.36) long; telofemur 0.265(0.26-0.265) long. Leg IV: entire femur 0.73(0.70-0.77) by 0.275(0.25-0.27); tibia 0.55(0.555-0.585) by 0.13(0.125-0.14).

Etymology.—The species is named for the mountain, El Yunque, on which it is found.

Ideobisium peregrinum Chamberlin

Ideobisium peregrinum Chamberlin 1930:37, 1931:Figs. 11R, 35F, G, H, 40S, 43J, K, 50C.

Material examined.—Holotype male (JC 94.02001), from under long in beech forest at Days Bay, Wellington Harbor, New Zealand [JCC]; allotype female, in leafmould near Wellington, New Zealand [JCC]; paratype female from Kingston, Lake Watipu (= Wakatipu), New Zealand, [BM(NH)].

Diagnosis.—A good species of *Ideobisium*, much like the American forms, but with eight setae at posterior margin of carapace and eight or more setae on tergite 2.

Description.—The original description by Chamberlin is very brief and without illustration; however, several figures of the species were provided later (Chamberlin 1930: listed above). In order to compare this species with others in the genus, the following supplemental data are given. Male and female much alike. Palps, carapace and tergites well sclerotized, brown. Carapace smooth; epistome low, broad, rounded; four eyes, with flattened corneas; chaetotaxy of holotype 4-4-4-5-8 = 25, of allotype 4-4-4-4-7 = 23, and of paratype 4-4-4-3-8 = 23. Coxal area typical; palpal coxa with two long setae at the apex. Abdominal tergites and posterior sternites entire, anterior sternites weakly divided; pleural membranes granulate anteriorly, becoming granulo-striate posteriorly. Tergal chaetotaxy of holotype male 6:8:9:9:9:10:10:10:8:7:T1T1T1T:2; sternal chaetotaxy of same 8:[3-3]:(4)6(3):(2)6(2):11:10:12:12:11:11:T1T:2; anterior operculum of female with six setae in a transverse row. Internal genitalia of male shown by Chamberlin (1931: Fig. 50C).

Chelicera 0.6 as long as carapace; hand with five setae, *es* short; flagellum of six or seven dentate setae, the proximal one shorter than the others; each finger with 10-15 teeth; galea slender, gently curved, longer in female than in male.

Palp stout; femur 2.7-2.75, tibia 1.85-2.0, and chela 2.5-2.6 times as long as broad; hand 1.35-1.5 times as long as deep; movable finger 0.9 as long as hand. All surfaces smooth. Fixed chelal finger with 31-36 and movable finger with 38-42 contiguous marginal teeth, of which only the distal 10-12 are cusped. Trichobothria on chela as shown by Chamberlin (1931; Fig. 35G); *isb*, *esb* and *eb* closer together and more distal on the hand than in the American species of the genus; *t* shorter than the others and lanceolate toward the tip.

Legs rather short and stout (see Chamberlin 1931: Figs. 43J, K). Leg I with basifemur 1.4 times as long as telofemur. Leg IV with entire femur 2.55-2.7 and tibia 3.85-4.0 times as long as deep. Tactile seta proximad of middle on tibia and each tarsal segment.

Measurements (mm).—Figures given in order for holotype, allotype, and paratype. Body length 2.18, 2.53, 2.21. Carapace length 0.70, 0.68, 0.66. Chelicera 0.41, 0.42, 0.39 by 0.215, 0.215, 0.20. Palpal femur 0.65, 0.63, 0.57 by 0.235, 0.23, 0.21; tibia 0.605, 0.57, 0.57 by 0.30, 0.295, 0.26; chela (without pedicel) 1.01, 1.035, 0.91 by 0.40, 0.40, ?; hand (without pedicel) 0.585, 0.59, 0.495 by 0.39, 0.40, 0.37; pedicel about 0.08 long; movable finger 0.53, 0.525, 0.46 long. Leg I: basifemur 0.30, 0.29, 0.26 long; telofemur 0.21, 0.21, 0.185 long. Leg IV: entire femur 0.595, 0.59, 0.51 by 0.23, 0.23, 0.19; tibia 0.46, 0.46, 0.40 by 0.12, 0.12, 0.10.

Remarks.—It should be noted that the paratype female, from South Island, is smaller than the other two specimens, but is a fully mature female, *not* immature as stated by Chamberlin (1930:37). The species has also been recorded from Oamaru, on seashore (Beier 1948) and from Nelson, Buller Gorge, *Nothofagus* litter (Beier 1967).

Ideobisium antipodum (Simon)

Obisium antipodum Simon 1880:174.

Ideobisium antipodum: Beier 1932:160, 1940:168, 169, 1968:762, Fig. 4.

The original description, based on the type from Nouméa, New Caledonia, was supplemented by Beier (1968) on the basis of a male specimen from the Grotte de Ninrin-Reu, near Poya, New Caledonia. It has also been reported from the Ellice Islands (Beier 1940).

Ideobisium (?) *gracile* Balzan

Ideobisium (*Ideoroncus*) *gracilis* Balzan 1891:540, Fig. 31, 31a; Beier 1932:158.

This species is reported only from Venezuela. The type(s), which probably should be in the MNHN, Paris, along with those of *Ideobisium crassimanum* Balzan and *Ideoblothrus similis* Balzan, cannot be located (per Dr. J. Heurtault). No other specimens are known which conform to the description given by Balzan.

Balzan placed *I. gracilis* in the subgenus *Ideoroncus* because it purportedly possessed two eyes. However, if his description and figure 31 are accurate, the species does not belong in *Ideoroncus* or any of the Ideoroncidae as presently understood; the shape of the palps and the epistome on the carapace are more characteristic of *Ideobisium* or *Ideoblothrus*. It is possible that this is an *Ideobisium* like *I. chapmani*, in which the eyes are reduced and which appeared, on superficial examination, to have only two (anterior) eyes. Final determination in this matter must await location of the type or collection of topotypes.

Other species, originally placed in *Ideobisium* by their authors, have already been disposed of as follows:

I. minutum Tullgren 1905, assigned to *Hya* Chamberlin (Beier 1932:167).

I. quadrispinosum Tullgren 1907, made the type species of *Gymnobisium* Beier (1931:304).

- I. tibiale* Banks 1909, tentatively assigned to *Syarinus* (Chamberlin 1930:40; Beier 1932:164) or *Microcreagris* Balzan (Hoff 1956:8). Having examined the holotype female of this species [MCZ], I support Hoff's assignment.
- I. magnum* Banks 1909, assigned to *Microcreagris* (Chamberlin 1930:28).
- I. tacomense* Ellingsen 1909a and *I. pyrenaicum* Ellingsen 1909b, assigned to *Microcreagris* (Beier 1932:154, 156).
- I. hispanicum* Ellingsen 1910, assigned to *Microcreagris* (Beier 1932:155), later transferred to *Microcreagrina* Beier (Beier 1970:45).
- I. racovitzai* Ellingsen 1912b, made the type species of *Troglobisium* Beier (1939:189).
- I. orientale* Redikorzev 1922, made the type species of *Halobisium* Chamberlin (1930:35).
- I. cavimanum* Beier 1930, made the type species of *Mirobisium* Beier (1931:304).
- I. formosum* Mello-Leitão 1937, assigned to *Geogarypus* Chamberlin (Mahnert 1979:750, 761).

Genus? *formosanum* (Ellingsen)

Ideobisium formosanum Ellingsen 1912a:125; Beier 1932:160.

This species is known only from the type specimens from Koroton, Formosa.

Though no illustrations are given, Ellingsen is very explicit about the form of the cheliceral galea of this species; it is said to be "shaped like a fan," with several branches. Because all known species of *Ideobisium* (and *Ideoblothrus*) as here defined have simple galeae, this form must belong to some other genus, possibly to *Microcreagris* or *Syarinus*.

Obisium trifidum Stecker 1875 was tentatively assigned to *Ideobisium* by Beier (1932:160); this assignment has been reported without comment by Murthy and Ananthakrishnan (1977:2). No further data on the species have become available, but if Stecker's figures are correct it cannot be retained in *Ideobisium* as here defined. The cheliceral galea is quite different from that found in *Ideobisium* species.

Ideoblothrus Balzan

Ideoblothrus Balzan 1891:541 (subgenus of *Ideobisium* Balzan). Type species *Ideoblothrus similis* Balzan 1891, by original designation.

Pachychitra Chamberlin 1938:111. Type species *Pachychitra maya* Chamberlin 1938, by original designation. Hoff 1945:1; Hummelinck 1948:63; Hoff 1964:7; Muchmore 1972:262, 1979:195. NEW SYNONYMY.

Diagnosis (revised).—A genus of the superfamily Neobisioidea Chamberlin (1930:7). Species small and robust. Carapace about square; anterior margin with a small, rounded, triangular epistome; surface smooth; no eyes present; 22-26 vestitural setae, with four at anterior and four to six at posterior margin. Apex of palpal coxa acute, with two long setae. Tergites and sternites entire, except that sternites 3-5 may be weakly divided; surfaces smooth; tergite 1 usually with six or seven setae, following tergites with eight or nine; pleural membranes finely, longitudinally striate. Internal genital setae of male arranged as two triangular groups of three. Cheliceral fingers toothed; hand with five acuminate setae, es shortest; flagellum of five or six finely denticulate setae, and in some

species a short, simple, proximal one; galea long, simple. Palp robust, none of the segments more than 3.0 times as long as broad; surfaces smooth except for fine granules on flexor sides of femur, tibia, and chelal hand at base of fingers; movable chelal finger usually as long as or longer than chelal hand; venom apparatus developed only in fixed finger, with short duct, extending less than half the distance to trichobothrium *et*; chelal teeth contiguous, at least the distal ones cusped. Trichobothrium *t* on movable chelal finger shorter than all others and lanceolate toward tip. *t*, *st* and *sb* closely grouped in an obliquely oriented series, with *t* distad of middle of finger; *est*, *it* and *ist* all near middle of fixed finger, distinctly proximad of *et*; *isb*, *esb* and *eb* in an oblique series on side of hand just proximad of base of fingers. Leg I with basifemur slightly longer (usually 1.1 or less) than telofemur. Leg IV with dorsal margin of femur smooth across the suture between its parts, the suture itself slightly oblique to long axis of femur; tibia with a tactile seta at or distad of middle, tarsal segments each with a tactile seta proximad of middle. Subterminal tarsal setae finely denticulate in distal half; arolia as long as or longer than claws.

Distribution.—Northern South America, Central America and Mexico, Greater Antilles and Florida, Central and South Africa, Seychelles Islands, New Guinea, and Solomon and Caroline islands. It is undoubtedly pantropical.

Remarks.—Examination of the holotype of *Ideoblothrus similis* (see below) makes it perfectly clear that *Ideoblothrus* Balzan and *Pachychitra* Chamberlin are identical.

Ideoblothrus is very similar to *Ideobisium* Balzan but can easily be distinguished from it by the absence of eyes, and the entirely smooth, longitudinally striate abdominal pleural membranes. In addition, the two genera differ in the detailed location of trichobothria on the chelal fingers, the presence or absence of granules on the palpal segments, the nature of the articulation between parts of the femur of leg IV, the length of the pedal arolia with respect to the claws, and the placement of the internal genital setae of the male.

Ideoblothrus also appears similar in general form to *Alocobisium* Beier, *Microcreagrella* Beier, and *Microcreagrina* Beier, but may be separated easily from those genera, all of which have at least one trichobothrium situated well back on the dorsum of the chelal hand.

Ideoblothrus similis Balzan

Fig. 17

Ideobisium (Ideoblothrus) similis Balzan 1891:541.

Ideobisium simile: Beier 1932:159.

Material.—Holotype male from Petare, Venezuela (Col. Mus. 13.839), [MNHN]. The specimen is mounted on two microscope slides, numbered 440 and 441; the left chela is missing and the right palpal segments are badly crushed. No other specimens are known.

Description of holotype.—All parts light brown or tan. Carapace smooth; epistome broken, but apparently low, rounded; no eyes present; chaetotaxy 4-4-4-4-6 = 22. Coxal area generally typical of the Neobisioidea; apex of palpal coxa acute, with two long setae.

Abdomen elongate; tergites and posterior sternites entire, anterior sternites weakly divided; surface smooth; pleural membranes longitudinally striate, the striae irregular anteriorly. Tergal chaetotaxy 7:7:8:9:9:9:9:9:7:T1T1T1T:2; sternal chaetotaxy 8:[3-3]:(2)4/6(2):(2)8(2):10:11:11:9:9:9:T1T:2; genital opercula as shown in Fig. 17; internal genitalia partly obscured, but as far as can be seen are much like those figured for *Pachychitra floridensis* Muchmore (1979:196).

Chelicera 0.56 as long as carapace; hand with five acuminate setae, *es* very short; flagellum apparently of five subequal, finely denticulate setae (position is such that it is not possible to determine whether a short proximal seta is present); fixed finger with about 14 small teeth, and movable finger with seven medium and about 10 tiny basal teeth; galea slender, straight; serrula exterior with about 24 blades.

Palp rather stout (see Balzan 1891: Fig. 32); segments more or less as described by Balzan, except that movable finger of chela is not “*manu breviores*”, but is actually 1.1 times as long as hand (without pedicel). Fixed chelal finger with about 35 and movable finger with about 40 contiguous marginal teeth. The chela is badly crushed, but it can be seen that the trichobothria occupy positions as in *Pachychitra maya* (see Chamberlin 1938:110 and Fig. 1B); on movable finger *t* is distal to middle of finger; on fixed finger *est*, *it* and *ist* are near middle of finger distinctly proximad of *et*; and *isb*, *esb* and *eb* form an oblique linear series on side of hand just proximad of base of fingers; as *t* is missing from its socket on the one chela present, its form cannot be determined.

Legs rather short and stout. Leg I with basifemur only slightly longer than telofemur. Leg IV with entire femur 2.5 and tibia 4.05 times as long as deep. The femora are not in suitable positions to observe the dorsal outline or the interfemoral suture. Subterminal setae finely denticulate; arolia slightly longer than claws. Tibia of leg IV with a tactile seta just distad of middle; each tarsal segment with a tactile seta proximad of middle.

Measurements (mm).—Body length 1.62. Carapace length 0.435. Chelicera 0.245 by 0.125. Palpal femur 0.385 by ?; tibia 0.37 by ?; chela (without pedicel) 0.63 by ?; hand (without pedicel) 0.31 by ?; pedicel 0.06 long; movable finger 0.34 long. Leg I: basifemur

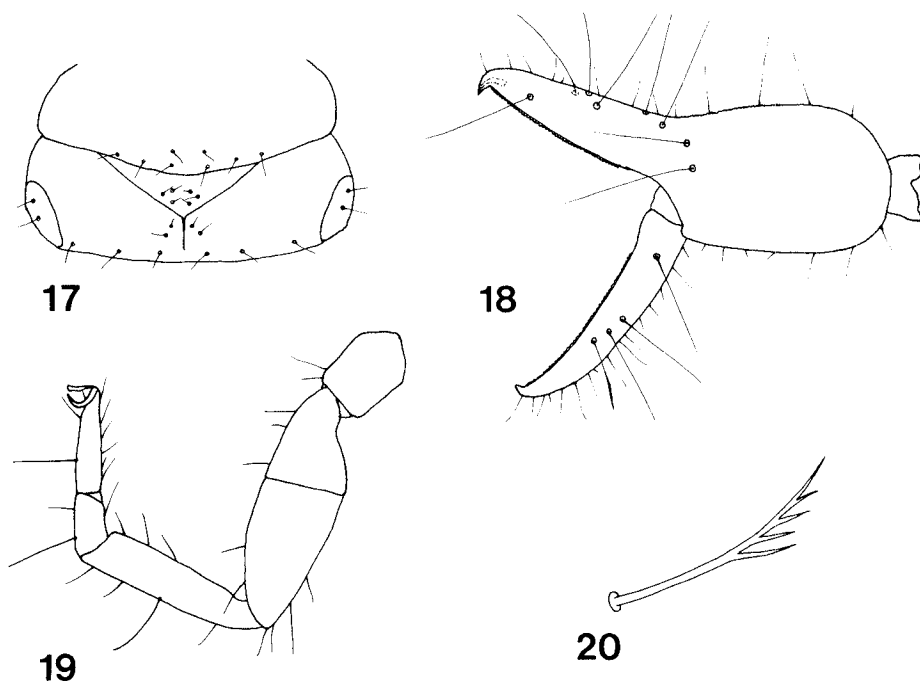


Fig. 17.—*Ideoblothrus similis* Balzan, holotype male: genital opercula. Figs. 18-20.—*Ideoblothrus kochalkai*, new species, holotype male: 18, lateral view of left chela; 19, leg IV; 20, subterminal tarsal seta (much enlarged).

0.16 long; telofemur 0.145 long. Leg IV: entire femur 0.31 by 0.125; tibia 0.265 by 0.065; metatarsus 0.095-0.05; telotarsus 0.155 by 0.04.

Remarks.—It is unfortunate that trichobothrium *t* is missing from its socket on the one chela available for this specimen. However, it can reasonably be expected that its form would be like that in *Pachychitra* species because this species resembles *Pachychitra maya* and others in all major details.

Beier (1974:101) considered *Ideobisium costaricense* (see below) a synonym of *I. similis*. This is almost certainly incorrect, given the great geographical separation of the two forms and the large amount of speciation in the genus.

***Ideoblothrus kochalkai*, new species**

Figs. 18-20

Material.—Holotype male (WM 4837.01001) and paratype female from under rocks at Casa Antonio (elev. 2700 m), Cuchilla Cebolleta, Sierra Nevada de Santa Marta, Magdalena, Colombia, 8 May 1975, J. A. Kochalka [FSCA].

Diagnosis.—Generally similar to *I. similis*, but much larger and with more slender appendages; palpal femur longer than 0.7 mm and with 1/w greater than 2.75.

Description.—Male and female similar but female larger. Carapace and palps reddish brown, other parts lighter. Carapace smooth; epistome small, triangular; no eyes; chaetotaxy 4-4-4-4-5 = 21. Coxal area typical; palpal coxa acute, with two long setae.

Abdominal tergites and posterior sternites entire, anterior sternites weakly divided; pleural membranes longitudinally striate. Tergal chaetotaxy of holotype 6:8:9:9:9:9: 9: 9: 9: 7: T 1 T 2 T 1 T: 2; s t e r n a l c h a e t o t a x y (m a l e) 15:[3-3]:(3)4/6(3):(2)9(2):10?:9:10:10:9: T1T:2; anterior genital operculum of female with transverse row of six setae.

Chelicera 0.6 as long as carapace; hand with five setae, *es* very short; flagellum of six or seven denticulate setae, the proximal one shorter than the others; galea of male slender, straight, not reaching as far as tip of galeal seta, that of female curved, reaching beyond *gs*; serrula exterior with about 30 blades.

Palp stout; femur 2.8-3.05, tibia 2.1, and chela 2.55-2.9 times as long as broad; hand 1.4-1.45 times as long as deep; movable finger about as long as hand. Surfaces smooth except for a few granules on medial sides of femur, tibia, and chela at base of fingers. Fixed chelal fingers with 47-48 contiguous, cusped, marginal teeth; movable finger with 55-57 contiguous teeth, only the distalmost 10-12 with cusps. Trichobothria on chela as shown in Fig. 18; *t* shorter than the others and narrowly blade-like in the outer third.

Legs less stout than usual for the genus (Fig. 19); leg I with basifemur 1.05-1.1 times as long as telofemur; leg IV with entire femur 3.0-3.2 and tibia 4.45-4.75 times as long as deep. Tactile seta on leg IV just distad of middle of tibia and proximad of middle of each tarsal segment. Subterminal tarsal setae strongly dentate on distal half (Fig. 20).

Measurements (mm).—Figures given first for the holotype male, followed in parentheses by those of paratype female. Body length 2.3(2.85). Carapace length 0.74(0.88). Chelicera 0.445(0.53) long. Palpal femur 0.72(0.88) by 0.255(0.29); tibia 0.665(0.78) by 0.32(0.385); chela (without pedicel) 1.18 (1.43) by 0.41(0.555); hand (without pedicel) 0.59(0.77) by 0.41(0.54); pedicel 0.10(0.12) long; movable finger 0.66(0.725) long. Leg I: basifemur 0.30(0.34) long; telofemur 0.27(0.32) long. Leg IV: entire femur 0.695(0.785) by 0.23 (0.245); tibia 0.555(0.64) by 0.125(0.135).

Etymology.—The species is named for John A. Kochalka, who collected the specimens.

Ideoblothrus colombiae, new species

Figs. 21, 22

Material.—Holotype male (WM 4838.01002) and four paratypes (3♂, 1♀) sifted from leaf litter between San Pedro and San Javier (elev. 1563 m), Sierra Nevada de Santa Marta, Magdalena, Colombia, 29 March 1975, J. A. Kochalka; paratype male from leaf litter N of San Pedro (elev. 960 m), S. N. de Santa Marta, 19 May 1975, J. A. Kochalka, [FSCA].

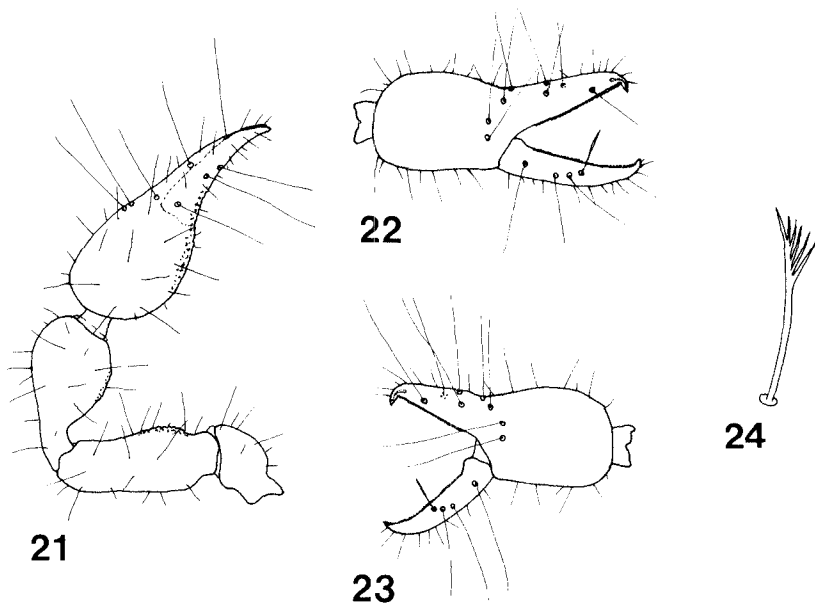
Diagnosis.—Generally similar to *I. similis* but slightly larger (palpal femur 0.41 mm or longer) and with fewer setae on carapace and abdomen.

Description.—Male and female similar but female slightly larger. Carapace and palps light brown, other parts much lighter. Carapace smooth; epistome small, rounded; no eyes; chaetotaxy of holotype and three paratypes 4-4-4-4.5 = 21, others with only 4 at posterior margin. Coxal area typical; palpal coxa acute, with two long setae.

Abdominal tergites and posterior sternites entire, anterior sternites faintly divided; pleural membranes longitudinally striate, the striae slightly roughened anteriorly. Tergal chaetotaxy of holotype 6:7:9:8:9:8:8:8:9:7:T1T1T1T:2; others similar; sternal chaetotaxy of holotype male 9:[3-3]:(3)4/5(3):(2)8(2):10:10:9:9:9:8:T1T:2, other males similar; anterior genital operculum of female with seven setae in a transverse row.

Chelicera about 0.55 as long as carapace; hand with five setae, *es* very short; flagellum of six denticulate setae, the proximal one only half as long as the others; galea of male slender, straight, not reaching as far as tip of galeal setae, that of female curved, reaching beyond *gs*; serrula exterior with about 28 blades.

Palp stout (Fig. 21); femur 2.3-2.6, tibia 1.9-2.0, and chela 2.55-2.75 times as long as broad; hand 1.3-1.35 times as long as deep; movable finger 1.03-1.17 times as long as



Figs. 21, 22.—*Ideoblothrus colombiae*, new species, holotype male: 21, dorsal view of left palp; 22, lateral view of right chela. Figs. 23, 24.—*Ideoblothrus seychellesensis* (Chamberlin), holotype: 23, lateral view of left chela; 24, subterminal tarsal seta (much enlarged).

hand. Surfaces smooth except fine granulations medially on femur and tibia and distinct granules on chela at base of fingers. Fixed chelal finger with 31-34 contiguous, cusped marginal teeth; movable finger with 37-40 contiguous teeth, only the distalmost 8-12 cusped. Trichobothria on chela as shown in Fig. 22; *t* shorter than others and narrowly flattened in outer third.

Legs rather stout; leg I with basifemur 1.0-1.1 times as long as telofemur; leg IV with entire femur 2.5-2.7 and tibia 2.55-2.7 times as long as deep. Tactile setae on leg IV just distad of middle of tibia and proximad of middle of each tarsal segment. Subterminal tarsal setae strongly dentate in outer halves; arolia slightly longer than claws.

Measurements (mm).—Figures given first for holotype, followed in parentheses by ranges for the paratypes. Body length 1.75(1.7-1.8). Carapace length 0.55(0.52-0.56). Chelicera length 0.30(0.27-0.30). Palpal femur 0.46(0.41-0.48) by 0.18(0.16-0.185); tibia 0.435(0.40-0.445) by 0.22(0.20-0.23); chela (without pedicel) 0.725(0.67-0.80) by 0.27(0.245-0.31); hand (without pedicel) 0.37(0.34-0.40) by 0.27(0.25-0.30); pedicel about 0.07 long; movable finger 0.41(0.38-0.41). Leg I: basifemur 0.18(0.17-0.185) long; telofemur 0.18(0.16-0.17) long. Leg IV: entire femur 0.43(0.41-0.47) by 0.165(0.155-0.18); tibia 0.325(0.32-0.36) by 0.09(0.085-0.095).

Etymology.—The species is named for Colombia, where it is found.

Remarks.—This species is similar to *I. kochalkai* but is much smaller — length of palpal femur 0.41-0.48 mm compared to 0.72-0.88 mm.

Ideoblothrus seychellesensis (Chamberlin), new combination
Figs. 23, 24

Ideobisium seychellesensis Chamberlin 1930:38, Figs. 1X, DD, 2CC, Beier 1932:160.

Ideobisium seychellesense: Beier 1940:165; Mahnert 1978b:885.

The holotype (JC 510.01001) has been examined. As Chamberlin (1930:38) has explained, the body was lost and the specimen presently consists of two palps, two chelicerae, two legs I and two legs IV, mounted on two slides [BM(NH), 1924-X1-3.49 and 3.49A]. This, the only known specimen, was taken by the Seychelles Expedition of 1908, probably on Félicité Island, Seychelles Islands (not “on the Felicete” as Chamberlin, states). For some unknown reason the type slides are labelled *Xenobisium seychellesensis*, in Chamberlin’s hand. Evidently, Chamberlin contemplated erecting a genus *Xenobisium* to include this species, but he never actually did so.

As Chamberlin’s description is rather brief, a more detailed account is given here. Chamberlin reported that the specimen is a female; in the absence of the abdomen, this cannot be verified. Chelicera with five setae on the hand, *es* rather short; flagellum of six setae, subequal in size and all finely denticulate; fixed finger with 11 small, and movable finger with 9 larger, teeth; galea slender, curved and reaching beyond tip of galeal seta.

Palp stout; femur 2.6, tibia 1.9, and chela 2.3 times as long as broad; hand 1.3 times as long as deep; movable finger 0.96 as long as hand. Surfaces smooth except sparse, fine granulation on medial sides of femur, tibia and chela at base of fingers. Fixed chelal finger with 34 and movable finger with 42 contiguous teeth, in each case only the more distal ones cusped. Trichobothria on chela as shown in Fig. 23; *t* much shorter than the others and thickened, but apparently not flattened (both are present).

Legs rather short and stout, as shown by Chamberlin (1930:Figs 1, X and DD). Leg I with basifemur 1.15 times as long as telofemur. Leg IV with entire femur 2.55 and tibia

3.5 times as long as deep; outer contour of femur smooth; tactile setae just distal of middle on tibia, but proximal of middle on each tarsal segment. Pedal arolia slightly shorter than claws; subterminal tarsal setae strongly denticulate near tip, as shown in Fig. 24.

Measurements (mm).—Chelicera 0.27 by 0.15. Palpal trochanter 0.25 by 0.19; femur 0.39 by 0.15; tibia 0.37 by 0.195; chela (without pedicel) 0.65 by 0.285; hand (without pedicel) 0.355 by 0.275; pedicel 0.05 long; movable finger 0.34 long. Leg I: basifemur 0.17 long; telofemur 0.15 long. Leg IV: entire femur 0.38 by 0.15; tibia 0.28 by 0.08; metatarsus 0.095 by 0.06; telotarsus 0.155 by 0.05.

Remarks.—In some details this description differs from that of Chamberlin. Most of the differences are small and of no significance. However, it should be noted that the palps are not entirely smooth, as suggested by Chamberlin, but actually do have a few fine granules on the femur, tibia and chela. Also, the movable chelal finger is not “clearly a little longer than hand,” as stated by Chamberlin, but is actually a little shorter than the hand. And further, the subterminal tarsal setae are not quite as depicted by Chamberlin (1930:Fig. 2, CC); they are more as shown in Fig. 24, thus not so different from those of other species of *Ideoblothrus* (cf. Chamberlin 1938:Fig. 1, F; and Fig. 20 above).

In spite of the absence of the body showing the character of the eyes and pleural membranes, it is evident that this species belongs not to *Ideobisium* but to *Ideoblothrus*. This is evidenced by the granulations on the palpal segments, the disposition of trichobothria on the chela, and the smooth contour of femur IV.

It should be noted that Mahnert's (1978) implication that the pleural membrane of this species is granulate is probably incorrect. Chamberlin did not record the character of the pleural membranes before losing the abdomen, and no other specimens have been examined. However, it is likely that the pleural membranes here are smoothly striate, as in other members of the genus.

The following species are assigned to *Ideoblothrus* because, according to detailed descriptions, they possess combinations of characters clearly representative of that genus, e.g., lack of eyes, longitudinally striate pleural membranes, robust palps, distribution of trichobothria on palpal chela, and acute apex of palpal coxa with two setae.

Ideoblothrus costaricensis (Beier), new combination

Ideobisium costaricense Beier 1931:302, Fig. 2, 1932:159, Fig. 191.

Beier (1974) placed this species in the synonymy of *I. similis*, but it is almost certainly distinct.

Distribution.—Known only from the type localities, Tuis and San Jose, Costa Rica.

Ideoblothrus maya (Chamberlin), new combination

Pachychitra maya Chamberlin 1938:111, Figs. 1A-F; Hummelinck 1948:71, Figs. 26a-h, 27a-c.

I have examined the holotype female of *Pachychitra maya* (JC 897.01001), [JCC]. It is clearly congeneric with *I. similis*.

Distribution.—Known only from the type locality, “first cave on San Roque Road”, Oxkutzcab, Yucatan, Mexico.

Ideoblothrus fenestratus (Beier), new combination*Ideobisium fenestratum* Beier 1954:3, Fig. 3.**Distribution.**—Known only from the type locality, Sivia, south Peru.*Ideoblothrus mexicanus* (Muchmore), new combination*Pachychitra mexicana* Muchmore 1972:262, Figs. 1-3.**Distribution.**—Tamaulipas, Mexico.*Ideoblothrus vampirorum*, new name*Pachychitra similis* Muchmore 1972:264, Figs. 4, 5.*nec Ideoblothrus similis* Balzan 1891:541.

With the recognition that *Pachychitra* is a synonym of *Ideoblothrus*, the name *Pachychitra similis* Muchmore becomes a junior homonym of *Ideoblothrus similis* Balzan and must be replaced. The new name *vampirorum* refers to the vampire bats in Cueva de los Vampiros, the type locality for the species.

Distribution.—Known only from the type locality in Tamaulipas, Mexico.*Ideoblothrus grandis* (Muchmore), new combination*Pachychitra grandis* Muchmore 1972:266, Figs. 6, 7.**Distribution.**—Known only from the type locality, Cueva del Tio Ticho, Chiapas, Mexico.*Ideoblothrus insularum* (Hoff), new combination*Pachychitra insularum* Hoff 1945:1, Figs. 1-5; Hummelinck 1948:73, Figs. 29a-b; Hoff 1964:8.**Distribution.**—Desecheo Is., Puerto Rico, and Jamaica.*Ideoblothrus curazavius* (Hummelinck), new combination*Pachychitra curazavia* Hummelinck 1948:63, Figs. 23a-g, 24a-f, 25a-f.**Distribution.**—Known only from Curaçao.*Ideoblothrus pygmaeus* (Hoff), new combination*Pachychitra pygmaea* Hoff 1964:9, Figs. 1, 2.**Distribution.**—Jamaica.

Ideoblothrus truncatus (Hoff), new combination

Pachychitra truncata Hoff 1964:11, Figs. 3, 4.

Distribution.—Known only from the type locality, Maggotty Falls, Parish of St. Elizabeth, Jamaica.

Ideoblothrus carinatus (Hoff), new combination

Pachychitra carinata Hoff 1964:13, Figs. 5, 6a-b.

Distribution.—Known only from the type locality, near Hardwar Gap, Parish of St. Andrew, Jamaica.

Ideoblothrus floridensis (Muchmore), new combination

Pachychitra floridensis Muchmore 1979:195, Figs. 1-6.

Distribution.—Known only from the type locality, Big Pine Key, Monroe County, Florida.

Ideoblothrus amazonicus (Mahnert), new combination

Ideobisium amazonicum Mahnert 1979:743, Figs. 48-52.

Distribution.—Known only from the type locality, Rio Dementi, northern Amazonas, Brasil.

Ideoblothrus caecus (Mahnert), new combination

Ideobisium caecum Mahnert 1979:745, Figs. 53-58.

Distribution.—Known from along the Amazon River between Santarem and Manaus, Brasil.

Ideoblothrus brasiliensis (Mahnert), new combination

Ideobisium brasiliense Mahnert 1979:747, Figs. 59-64.

Distribution.—Known from along the Amazon River between Belem and Manaus, Brasil.

Ideoblothrus godfreyi Ellingsen, new combination

Ideobisium (Ideoblothrus) godfreyi Ellingsen 1912c:117; Beier 1947:290; Mahnert 1978a:94.
Gymnobisium godfreyi: Beier 1932:162.

Distribution.—Known only from the type locality, Frankfort Hill, King Williams Town Div., Cape Province, South Africa.

Ideoblothrus lepesmei (Vachon), new combination

Ideobisium lepesmei Vachon 1941:32, Mahnert 1978a:94.

Distribution.—Known only from the type locality, Sassandra, Ivory Coast, West Africa.

Ideoblothrus holmi (Beier), new combination

Ideobisium holmi Beier 1955:534, Fig. 5; Mahnert 1978a:94.

Distribution.—Known from eastern Kenya and western Democratic Republic of the Congo.

Ideoblothrus leleupi (Beier), new combination

Ideobisium leleupi Beier 1959:23, Fig. 10; Mahnert 1978a:94.

Distribution.—Known only from the type locality in western Democratic Republic of the Congo.

Ideoblothrus occidentalis (Beier), new combination

Ideobisium occidentale Beier 1959:25, Fig. 11; Mahnert 1978a:94.

Distribution.—Known only from the type locality along the lower Congo River in western Democratic Republic of the Congo.

Ideoblothrus baloghi (Mahnert), new combination

Ideobisium baloghi Mahnert 1978a:40, Figs. 48-50.

Distribution.—Known only from the type locality near Kindamba, Congo-Brazzaville, West Africa.

Ideoblothrus zicsii (Mahnert), new combination

Ideobisium zicsii Mahnert 1978a:92, Figs. 51-55.

Distribution.—Known only from the type locality near Sibiti, Congo-Brazzaville, West Africa.

Ideoblothrus bipectinatus (Daday)

Ideobisium bipectinatum Daday 1897:478, Tab, XI, Figs. 7, 14, 15; Beier 1932:160, Fig. 192; 1940:167; Morikawa 1963:4, Figs. 2a-c; Beier 1965:761, 1967:321.

Ideoblothrus bipectinatus: With 1906:87.

Distribution.—New Guinea and the Bismarck Archipelago.

Ideoblothrus palauensis (Beier), new combination*Ideobisium palausense* Beier 1957:13, Fig. 4a.**Distribution.**—Known only from the type locality, Palau, Caroline Islands.*Ideoblothrus pugil pugil* (Beier), new combination*Ideobisium pugil* Beier 1964:593, Fig. 1, 1966:137.**Distribution.**—Solomon Islands.*Ideoblothrus pugil robustus* (Beier), new combination*Ideobisium pugil robustum* Beier 1966:137, Fig. 3.**Distribution.**—Known only from the type locality, Nila Is., Solomon Islands.

Other species originally placed in *Ideoblothrus* by their authors have been disposed of as follows:

Ideobisium (Ideoblothrus) strandi Ellingsen 1901, assigned to *Microcreagris* Chamberlin (Beier 1932:155), more recently to *Syarinus* Chamberlin (Mahnert 1976:206).

I. roszkovskii Redikorzev 1922, designated the type species of *Pseudoblothrus* Beier (1931:21).

Species originally assigned to *Ideobisium (Ideoroncus)* are not considered here. They have all proved to be referable to various genera in the family Ideoroncidae, or in one case to *Syarinus*, family Syarinidae.

DISCUSSION

On the basis of the studies reported above, our concepts of the families Syarinidae and Neobisiidae must be changed in some important respects.

Representatives of the Syarinidae share many characters with those of the Neobisiidae and clearly belong to the superfamily Neobisioidea (Chamberlin 1930; Beier 1932, 1961, 1963; Hoff 1956, 1964). They have always been separated from the Neobisiidae by i) the nature of the abdominal pleural membranes — longitudinally striate in Syarinidae but granulate in Neobisiidae, and ii) the suture between the parts of the femur of leg IV — oblique to the long axis in Syarinidae but perpendicular in Neobisiidae (Chamberlin 1930; Hoff 1958; Beier 1963). However, difficulties with these distinctions have long been recognized.

As already pointed out by Mahnert (1979:750) the pleural membranes are somewhat varied between granular and striate in species of *Ideobisium*, and especially so in *Alocobisium* Beier (now considered a genus of the Syarinidae, according to Mahnert 1974:851). In addition, it can be noted that Morikawa (1963) states explicitly that the pleural membranes of the abdomen of *A. solomonense* are striated, not granulated. Chamberlin (1938), describing the femoral suture of *Pachychitra* as only “weakly oblique

to vertical," nevertheless assigned the genus to the Syarinidae. Hummelinck (1948) described the suture of *P. curazavia* as vertical; for *Alocobisium* Beier (1952) reported the articulation line "vertical to the long axis of the femur"; and the femoral sutures of *Microcreagrella*, *Microcreagrina* and *Hadoblothrus* are characterized by Beier (1963) as "senkrecht zur Längsachse des Gliedes." It is evident, therefore, that the pleural membranes and the femoral suture of leg IV are not uniform throughout the Syarinidae and frequently are similar to those found in the Neobisiidae; they cannot then be used as key characters for distinguishing members of the two families.

The taxa placed in the Syarinidae form a very diverse group. Three subfamilies have been recognized: Syarininae, Chitrellinae, and Microcreagrellinae. However, *Ideobisium* and *Ideoblothrus* do not fit comfortably into any of these and the positions of *Nannobisium* and *Alocobisium* have not been determined with certainty. Nevertheless, there seem to be two characters which can be used to separate (most of) the Syarinidae from the Neobisiidae; these are:

i) The apex of the palpal coxa is usually more or less triangular and bears two setae (rather than three or more). All the genera in question show this character clearly except *Syarinus*. In the latter, the apex of the coxa is low and rounded, so that the two apical setae are set very close to the setae bordering the trochanteral fossa and may be difficult to distinguish from them.

ii) Trichobothrium *t* (on the movable finger of the palpal chela) is often shorter than the other trichobothria and is flattened, or lanceolate, toward the distal end. As reported previously (Muchmore 1979), this feature has been seen by me in representatives of *Syarinus*, *Chitrella*, *Ideobisium*, *Ideoblothrus* (syn. *Pachychitra*), and *Nannobisium* (syn. *Vescichitra*). Mahnert (in litt.) has reported finding lanceolate trichobothria *t* in the West African species *Nannobisium liberiense* Beier and *Ideoblothrus lepesmei* (Vachon). In two specimens of *Alocobisium solomonense* Morikawa (det. M. Beier) examined by me, *t* is shorter than the others and appears slightly flattened near the end. On the other hand, in two paratypes of *Ideoblothrus roszkovskii* Redikorzev (type species of *Pseudoblothrus* Beier), trichobothrium *t* is *not* different from the other trichobothria. And Mahnert (in litt.) reports on the situation in some specimens in the Museum d'Histoire Naturelle, Genève, as follows:

Microcreagrina hispanica: *t* only slightly shorter, not lanceolate

Microcreagrella c. caeca: *t* shorter, not lanceolate

Troglobisium racovitza: *t* nearly the same length, not lanceolate

Pseudoblothrus ellingseni: *t* nearly same length, not lanceolate

Hadoblothrus gigas: *t* not shorter, not lanceolate

It appears, therefore, that in the forms from the Americas, the Pacific area, and Africa south of the Sahara, trichobothrium *t* is characteristically shortened and flattened, while in those from Mediterranean Europe and North Africa, *t* may or may not be shortened, and is not flattened.

Members of the family Syarinidae can, therefore, be recognized as follows: with the characters of the superfamily Neobisioidea, that is, all legs diplotarsate and chelicera with distinct teeth on both fingers; venom apparatus present only in fixed finger of palpal chela; apex of palpal coxa with two setae; and chela with usual complement of 12 trichobothria, of which *t* is usually short and lanceolate (except in European and North African forms). Within the Syarinidae pleural membranes may range from striate to granulate; the suture between the parts of the femur of leg IV may be oblique or

perpendicular to the long axis of the femur; a galea may be present or not; if present, the galea may be simple or divided; all trichobothria may be confined to the fingers or some may be located on the chelal hand; subterminal tarsal setae may be simple or denticulate; eyes may be present or absent.

The following couplet may now be used to distinguish between Syarinidae and Neobisiidae:

- Apex of palpal coxa usually triangular and with two setae; trichobothrium *t* short and lanceolate (except in European and North African forms); pleural membranes granulate or striate; if pleural membranes granulate, the chelal hand bears one or more trichobothria dorsally or laterally) Syarinidae
 Apex of palpal coxa rounded and with three or more setae; trichobothrium *t* similar in form to other trichobothria; pleural membranes granulate; trichobothria confined to chelal fingers Neobisiidae

The genera which comprise the family Syarinidae are

- Syarinus* Chamberlin 1925
Chitrella Beier 1932
Aglaochitra Chamberlin 1952
Pseudoblothrus Beier 1931
Troglobisium Beier 1939
Hadoblothrus Beier 1952
Ideobisium Balzan 1891
Ideoblothrus Balzan 1891 (syn. *Pachychitra* Chamberlin 1938)
Nannobisium Beier 1931 (syn. *Vescichitra* Hoff 1964)
Microcreagrella Beier 1961
Microcreagrina Beier 1961
Alocobisium Beier 1952

The remarkable species *Hyarinus hesperus* Chamberlin (1925) may belong here as suggested by Chamberlin (1930). However, Chamberlin's original description is not sufficiently detailed to allow a definite decision and the holotype, the only known specimen, cannot now be located.

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